INSTITUTE of STATISTICS
Oxford

Bulletin Vol. 8 *July 1946* *No. 7*

NOTE ON THE PRODUCTIVITY OF LABOUR: ITS CONCEPT AND MEASUREMENT

1. If problems of production are approached from the viewpoint of capital employing labour, the cheapness of labour relative to capital is one of the main factors determining the methods of production, and money costs of production are of paramount importance. If, on the other hand, the view is taken that labour employs capital (and not the other way round) to increase its standard of life by capitalistic methods of production, 'dear' labour becomes the object of policy and not one of its determining factors. Here labour ought to be made dear, and capital cheap; and an economics of plenty substituted for an economics of scarcity. Money costs of production, influenced by monopoly, market imperfections, low living-standards in oversea countries, and a host of other factors, are no longer sovereign. *Real* costs of production become now important, costs of production in terms of labour and other real factors of production. Ultimately, real costs of production can be reduced to labour costs and the cost of what the classical economists called 'waiting'. The third factor, land (in the Ricardian sense), has no real social cost attached to it; the function of rent is merely one of allocation and thus it is not important in considering the overall production of a given economy. Hence the importance of the concept of the productivity of labour. The problem of policy consists in increasing the productivity of labour, each increase in productivity being balanced against the increase in the cost of 'waiting' called forth.[1] The acceptance or rejection of hydro-electric schemes, for instance, depends chiefly on relative wages in coal-mining and in industries producing hydro-electric plant, and also on the customary rate of return on capital in different industries; it ought to depend on differences in manpower requirements between different methods of producing energy, to be balanced against differences in the amount of 'waiting' required.[2]

2. In this paper first the concept of productivity, then the problems created by its measurement, and lastly differences between productivity

---

[1] The cost of 'waiting' itself is to some extent arbitrary, depending on factors such as monetary policy or the distribution of income. Moreover, in a modern capitalist country there is a wide gap between the price for which people are willing to forego present consumption in favour of future consumption and the rate of return on capital which is enhanced by imperfect competition and private risk.

[2] Under a policy of full employment wages in different industries tend to express the (Marshallian) 'net advantages' of labour, and a cheap money policy carried to its logical end tends to make the rate of interest approach the price of 'waiting'. Hence, under this double policy, money costs become a better index of real costs.

and standards of living are discussed. Productivity of labour and actual production are two different concepts, and it is the former which is more important. Both productivity and production are relative and not absolute concepts; that is, they make sense only if comparisons of productivity or production are made between different periods of time or different areas. A comparison of production compares the total production of two periods (or areas), and it is clear that the effort of labour entering into these can be different. On the other hand comparisons of productivity refer to comparisons of *potential* production, that is the relative production of two periods which could have been achieved with the same effort of labour. Since economic welfare is the sum of material production and non-material leisure in which to enjoy the fruits of production, productivity is a far better index of economic welfare than actual production. It may be admitted, of course, that production is, other things being equal, a function of productivity. As productivity increases, production increases too but less than proportionately, an increasing proportion of human energy being devoted to leisure. The liberation from toil can take many forms : the length of the working week is reduced and longer annual holidays are taken; and the school-leaving age is raised.[1] How far the age of retirement or the proportion of married women at work (both factors influence actual production) is a function of the productivity of labour is doubtful; they are likely to be determined rather by social attitudes and institutional factors than by pure economic considerations.

3. Economic policy to increase the productivity of labour cannot be laid down unless (*a*) comparisons of productivity are made in quantitative terms, (*b*) differences in productivity attributed to their appropriate causes, and (*c*) the effects of alternative lines of policy forecast. At the moment we are still trying to explore the first heading, but certain broad facts have been already established, notably that productivity in United States mining, manufacturing, and construction industries is considerably higher than in this country. There can be no sharper stimulus for economic action than the demonstration of this fact; for then British industry could make large and rapid advance not by painful experiments and slow improvements in the existing state of technical knowledge but, simply, by the deliberate adoption of methods of production successfully employed elsewhere. Let us now turn to the first task, the principles of measuring productivity.

4. First, we can make direct comparisons of actual production and actual hours worked only. Productivity can be compared only if the hours worked in two periods (or areas) were the same, or if we knew the effect on production of a change in hours. It would not be correct to assume that hours and production change proportionately; hence in certain cases it might be wiser to state both production per head and hours per head, rather than state average hourly production alone. Again, there might be differences

---

[1] The latter no doubt was, historically, the effect of increased productivity ; but in the long run it might become its cause.

in the sex and age composition of the labour forces compared which, however, can be overcome by using the concept of ‘ equivalent men ’. It cannot be assumed though that the productive power of (say) men and women is proportional to their earning power.[1]

5. A comparison of productivity is, par excellence, an index number problem. A number, *n*, commodities are produced in quantities $q_1, q_2, \ldots, q_n$ per unit of time, employing $m_1, m_2, \ldots, m_n$ workers, respectively. During a different period (or in another country) these commodities are produced in quantities $q'_1, q'_2, \ldots, q'_n$ by employing $m'_1, m'_2, \ldots, m'_n$ workers, respectively. The productivity ratio, taking the first period (country) as the base, is written as

$$i_k = \frac{q'_k}{m'_k} \div \frac{q_k}{m_k} = \frac{q'_k}{q_k} \div \frac{m'_k}{m_k}, \text{ where } k=1, 2, \ldots, n,$$

and the index of productivity for industry as a whole is

$$I = \frac{\sum_1^n i_k w_k}{\sum_1^n w_k} .$$

w_k stands for the weight attached to the *k*th commodity, and logically we ought to have $w_k = m_k'$, so that the index *I* should have a commonsense meaning. Now

$$I = \frac{\sum_1^n i_k m'_k}{\sum_1^n m'_k} = \frac{\sum_1^{n\,\prime} \frac{q'_k}{q_k} m_k'}{\sum_1^n m'_k}$$

means that if we substitute workers of the first period (or country) together with their equipment, for those of the second, we must increase the total number of workers *I* times in order to produce the same output.[2] The problem is, of course, symmetrical, and we may write

$$i' = \frac{1}{i}, \text{ and}$$

$$I' = \frac{\sum_1^n i'_k m_k}{\sum_1^n m_k} = \frac{\sum_1^n \frac{1}{i_k} m_k}{\sum_1^n m_k} = \frac{\sum_1^n \frac{q}{q'_k} m'_k}{\sum_1^n m_k} ,$$

which means that if we substitute workers of the second period for those of the first, the total number of workers must be increased *I′* times in order to produce the same output.

---

[1] Differences in the skill of labour are ignored at this stage since we want to measure differences in productivity and not explain its causes. Differences in skill enter into the analysis at the second stage when differences in productivity are attributed to their causes. But differences in skill due to training are analogous to capital, and can be similarly resolved into labour costs and ‘ waiting ’.

[2] Or decrease if *I* is less than 1.

6. A number of problems arise which will be discussed one by one in this and the subsequent three paragraphs. Instead of an accurate index one should be able to prepare estimates valid within certain limits; and provided these limits are not unduly wide the estimates will serve practical purposes. There are four main difficulties : the first is theoretical, the next two arise from the nature of the statistics available, and the last is a practical one. The theoretical problem, the so-called index-number problem, arises from the fact that I and $\frac{1}{I'}$ are not necessarily equal. We obtain two results, and it is not legitimate to average them in order to obtain a single result.[1] In practice, however, all depends on the width of the gap between the limits, and experience has shown that often it is not wide. The gap depends partly on the dispersion of productivity ratios (i_k)—if they are all identical the index is uniquely determined—and partly on how far the differences in the two sets of weights are correlated with the productivity ratios. The dispersion of productivity ratios is not expected to be very great, but some correlation between these ratios and the weighting systems must be suspected as the result of economies of the scale of production.

7. The second difficulty arises from the nature of the statistics available. In the pure theory of §5 it was assumed that we can allocate to each commodity the appropriate part of the labour force producing it. This is not so because production is complex in the sense that (*a*) any firm or industry is using the product of other firms and industries, and (*b*) any firm or industry might produce more than one commodity. The statistics available refer to the firm as the unit and not to the commodity. Such statistics, the census of production statistics, gives *in the ideal case* for any industry the value of each commodity making up the output of the industry, value being resolved in each case into quantity and price, and similarly the value of each commodity forming the input of the industry.[2] The only possibility is to estimate the index of the volume of production (that is, output *less* input) using values as weights, and divide this by the ratio of the labour forces in the two periods (countries). Writing p_k (or p_k') for the price of the kth commodity, so that $q_k\, p_k$ (or $q_k'\, p_k'$) is its value, by formula

$$I = \frac{\sum_1^n \frac{q'_k}{q_k} \times q_k\, p_k \Big/ \sum_1^n q_k\, p_k}{\sum_1^n m'_k \Big/ \sum_1^n m_k} = \frac{\sum_1^n q'_k\, p_k}{\sum_1^n q_k\, p_k} \div \frac{\sum_1^n m_k'}{\sum_1^n m_k},$$

---

[1] *Cf.* J. M. Keynes, *A Treatise on Money*, ch. 8.

[2] In the language of the census of production the value of output is called ' gross output ', the value of input ' materials, fuel and power used in production ', and the difference between gross output and materials, etc., used is called ' net output ' or ' value added by production '.

$$\text{and } I' = \frac{\sum_{1}^{n} \frac{q_k}{q'_k} \times q'_k p'_k \Big/ \sum_{1}^{n} q'_k p'_k}{\sum_{1}^{n} m_k \Big/ \sum_{1}^{n} m'_k} = \frac{\sum_{1}^{n} q_k p'_k}{\sum_{1}^{n} q'_k p'_k} \div \frac{\sum_{1}^{n} m_k}{\sum_{1}^{n} m'_k},$$

instead of as above. The index-number problem enters into the picture again since the production index can be calculated by two different systems of weights, the two sets of outputs and inputs can be compared at either of two sets of prices. But write λ_k for net output per head (in terms of value) in the production of the *k*th commodity, so that

$$\lambda_k = \frac{p_k q_k}{m_k}, \quad i_k = \frac{\lambda'_k}{\lambda_k} \div \frac{p'_k}{p_k}$$

$$\text{and } I = \frac{\sum_{1}^{n} \frac{q'_k}{q_k} \times m_k \lambda_k \Big/ \sum_{1}^{n} m_k \lambda_k}{\sum_{1}^{n} m'_k \Big/ \sum_{1}^{n} m_k}$$

Now if net output per head is the same, λ, in the production of all commodities, the above index is identical to that in §5. Hence the expediency of the method described in this section implies the assumption of equal net outputs per head. Since within any industry wages for the same type of work tend to be equal, this method is valid only if there are reasons to assume that percentage gross profit margins are also equal for each commodity. In the calculation each item of input should be treated exactly as an item of output with a negative sign, that is each *q* in the above formula is negative if it refers to input and not output.[1] Having obtained the indexes for different industries (an ' industry ' being the smallest unit for which figures are published), we proceed to average these indexes as in §5, that is weighted by employment.[2] Allowances for the depreciation of capital used in production (the cost of capital apart from ' waiting ') should be regarded as an item of input; if this is done, our concept of ' net output ' will be (unlike the official one) a pure economic concept, and our index the correct index for the productivity of labour.[3]

8. It was pointed out in the preceding section that ideally *q* and *p* ought to be determined for each item of output and input. In practice this is often not possible; hence the third difficulty. The value of output and input can be divided into two parts : for the first part complete data are available in both periods (countries), and for the second part only incomplete data, given in terms of value which cannot be resolved into quantities and prices. It is

---

[1] *Cf.* R. C. Geary, *The concept of net volume of output*, J.R.S.S., 1944, pp. 251–61.

[2] Dr. Rostas used net output as weights (*Economic Journal*, 1943, p. 46) but the result obtained by this method does not answer the question set in §5 above.

[3] Hence the objection of Prof. Jewkes (Manchester School, Jan., 1946, p. 5) can be met.

impossible to proceed further without making an assumption. For the part with complete data it is possible to calculate both quantity and price index numbers by the usual method. Now for the part with incomplete data we can assume *either* that the quantity index *or* that the price index of the first part is valid. In certain cases, if the complete data cover the same proportion of the total value of output (or input) in both periods, the two assumptions *might* be consistent; otherwise they are not. The first assumption implies that the structure of industry is similar in both cases, the same proportions of different commodities being produced and the same proportions of raw materials used. The second assumption implies that the price structures are similar in both cases.[1] In making comparisons over short periods of time the figure for industry as a whole obtained by the two different methods might give almost identical results.[2] But this is not likely to happen if comparisons are made between countries, especially in the case of a single industry.[3] There seem to be strong reasons to prefer the second rather than the first assumption as far as international comparisons go. In a number of cases it is possible to construct price indexes where quantities are not similarly susceptible to measurement. Also, by working on prices, serious pitfalls can be avoided since, in spite of transport costs, tariffs, and imperfect competition, international price relatives for any commodity in which international trade is possible must lie within certain reasonable limits, thus affording a rough check at each stage of the calculation.

9. The fourth difficulty is a practical one arising from the fact that different things might be called by the same name. There are certain administrative changes in censuses of production from time to time, and the practice of different countries is also somewhat different. Most of these difficulties can be overcome by careful investigation, and there is hope that national differences will gradually be eliminated in the collection of these statistics. But the difficulty remains that commodities described by the same name differ in quality. This is a difficulty which can also be overcome but, being a practical difficulty, is not susceptible to blueprint solutions. As a first approximation it should be possible to say, by an appeal to direct experience, in which direction differences in quality should move the index of productivity; it should be possible to find someone who has driven both British and American cars. But it is possible to do even better. If the second assumption of §8 is adopted and price relatives are constructed, these price relatives can be refined by considering commodities of identical quality. It is possible for experts to name the American car corresponding in performance to a given British car.[4] Or we can compare prices in a market where the commodities

---

[1] For the formulas *cf.* A. L. Bowley, *Studies in the National Income*, pp. 144–5. The two assumptions were associated in the controversy in this country some years ago with the names of Dr. Rhodes and Mr. Devons, respectively.

[2] Ibid., p. 145.

[3] I gave figures showing the difference between the two assumptions in the case of the wireless industry in J.R.S.S., 1944, p. 48.

[4] This procedure was used to compare productivity in the motor industry by Mr. N. Kaldor in a letter to *The Times*. January 20th, 1945.

compete; British and American cars, for instance, can be compared at prices in the Australian market. In certain cases, especially when comparisons are made over long periods of time, reference can be made to an intermediate quality by using the method of link-relatives. In any case it should be possible to put the estimates within limits of error and thus defeat obscurantist tendencies coming from certain quarters.

Productivity in the United States and Britain.

10. Productivity in U.S. industries covered by censuses of production were compared with U.K. industries first by Professor Taussig for 1907, and it was found that U.S. productivity per man was about double that in the U.K.[1] This gap did not show signs of diminishing when Sir Alfred Flux or Colin Clark made similar comparisons.[2] For the years immediately before the war Dr. Rostas found that U.S. output per head was 2.3—2.4 times that in the U.K.[3] At the same time 35 hours per week were worked in the U.S. as against 47 in the U.K., so that U.S. hourly output was about 3 times that in the U.K. Similar estimates can be derived for the war years from official sources. In 1943, apparently the best year for purposes of comparison, the volumes of munitions production were: 'U.S. nearly 4 to U.K. 1.'[4] Since the relevant employment figures were in the proportion of 1.71 to 1,[5] U.S. production per head was 2.2—2.3 times that in the U.K., almost exactly as before the war. There was an increase in working hours in both countries during the war, the increase being greater in the U.S. but with actual hours still below the U.K. level. At the same time it is estimated that before the war consumption per head in the U.K. was 80—90 per cent of that in the U.S.[6] In the rest of this note an attempt is made to reconcile these two sets of estimates.

11. In the first place the proportion of persons gainfully employed is different in the two countries. Table I sets out the composition of the population and of the labour force. U.K. figures, for the sake of convenience, will refer to 1938, U.S. figures to 1939 throughout. 41 per cent of the U.S. population was in the labour force, against 47 per cent in the U.K. The reasons for this are the higher proportion of persons under 16 in the U.S.[7] (27 per cent against 23 per cent) and the lower proportion occupied in any class which more than offsets the somewhat younger age composition of the U.S. population. The difference in the proportion occupied is most marked in the groups aged 16 to 19 and to a lesser extent 20 to 29. The differences can be attributed almost exclusively to more extensive education in the U.S. The figures for elderly persons are not sufficiently reliable to warrant conclusions.[8] Applying the U.K. percentages to the U.S. population, the U.S.

---

[1] *Quarterly Journal of Economics*, 1925.

[2] *Quarterly Journal of Economics*, 1933, *and Conditions of Economic Progress*, ch. VIII.

[3] Economic Journal, 1943, p. 46. (U.S. 1937 and U.S. 1935).

[4] *The Impact of War on Civilian Consumption* (H.M.S.O., 1945), p. 11.

[5] Ibid., p. 157 and p. 160.

[6] Ibid., p. 142 (U.K. in 1938, U.S. in 1939).

[7] The number of boys and girls aged 14—15 in the U.S. was about three times that in the U.K., but the number employed was somewhat less.

[8] For elderly persons the margin between unoccupied and unemployed is not clearly defined.

TABLE I

Population and Labour Force, U.S., 1939 and U.K., 1938. (Annual Averages).

	U.S., 1939				U.K., 1938			
	Total	Labour Force			Total	Labour Force		
	mn.	mn.	% of Total	% of L.F.*	mn.	mn.	% of Total	% of L.F.*
Under 16 years	35.6	0.8	—	—	11.10	0.99	—	—
Men—								
16—19 years	4.9	2.8	*57*	5	1.66	1.43	*86*	7
20—29 „	11.0	10.1	*92*	19	3.71	3.57	*96*	17
30—44 „	14.2	13.5	*95*	25	5.15	4.98	*97*	23
45—59 „	10.9	9.9	*91*	19	3.87	3.65	*94*	17
60—64 „	2.4	1.9	*79*	4	1.04	0.89	*86*	4
65 and over	4.3	1.9	*43*	4	1.77	0.64	*36*	3
Total	47.7	40.1	(*84*)	75½	17.20	15.16	(*88*)	70½
Women—								
16—19 years	4.9	1.7	*35*	3	1.62	1.27	*78*	6
20—29 „	11.4	4.8	*42*	9	3.82	2.17	*57*	10
30—44 „	14.3	3.8	*27*	7	5.65	1.55	*27*	7
45—59 „	10.3	2.2	*21*	4	4.58	0.97	*21*	5
60—64 „	2.3	0.3	*14*	½	1.20	0.20	*17*	1
65 and over	4.5	0.3	*6*	½	2.32	0.19	*8*	1
Total	47.7	13.1	(27)	24½	19.19	6.35	(*33*)	29½
Total	131.0	54.0	(*41*)	100	47.49	22.50	(*47*)	100

* Refers to persons over 16 only.

Note.—All occupied persons are included in the labour force, both employed and unemployed. U.S. figures based on 1940 Census interpolated for 1939, and adjusted for annual averages. The seasonal fluctuations in the employment of young people was estimated from *The Labour Force Bulletin* (Dept. of Commerce). For U.K. figures see London and Cambridge Economic Service, Oct. 1945, ' A manpower budget for 1950 ', Table III. Figures given in *The Impact of War on Civilian Consumption* (H.M.S.O., 1945) are deficient.

labour force is deficient, according to British standards, by 6.5 million workers aged 16–64, 2.5 million men and 3.9 million women. Of these 3.5 million are aged 16—19, 2.2 million aged 20—29 (almost all near 20) and only 0.8 million above the age of university graduation. The factors affecting the differences in the proportion of the population in the labour force, apart from differences in the age composition and the extent of education, seem to be insignificant. The composition of the two labour forces is also different, the proportion of men to women being higher in the U.S., and the proportion of juveniles to adults lower. The proportion of the U.S. labour force to the total population is only 87 per cent of the similar ratio in the U.K., but weighing each category of the labour force by its productive power[1] this becomes 92 per cent, average productive power in the U.S. being 5—6 per cent higher than in the U.K.

---

[1] The following weights were assumed : Persons under 16, one-fifth ; 16 to 19, one-half ; 20 to 64 (men), one ; 20 to 64 (women), two-thirds ; 65 and over (men), two-thirds ; 65 and over (women), one-half.

TABLE II *Employment and Output, U.S., 1939 and U.K., 1938*

Industry	U.S., 1939				U.K., 1938			
	Employment		Output	Output per head	Employment		Output	Output per head
	mn.	%	$ billion	£	mn.	%	£ billion	£
Commodity producing industries :								
Agriculture, fishing, forestry	9.40	*20.6*	5.23	560	1.43	*7.0*	0.18	130
Mining	0.86	*1.9*	1.39	1,620	0.90	*4.4*	0.16	180
Manufacturing metals ...	3.46	*7.6*	7.10	2,050	2.72	*13.4*	0.55	200
,, textiles & apparel ...	2.52	*5.6*	2.92	1,160	1.90	*9.4*	0.28	150
,, food, drink, tobacco	1.34	*2.9*	2.57	1,920	0.67	*3.3*	0.25	370
,, other	3.14	*6.9*	6.03	1,920	1.89	*9.3*	0.40	210
Building and construction	2.07	*4.5*	3.02	1,460	1.30	*6.4*	0.23	180
Gas, water, electricity ...	0.52	*1.1*	1.75	3,370	0.24	*1.2*	0.12	500
Total	23.31	*51.1*	30.01	(1,290)	11.05	*54.4*	2.17	(200)
Commodity distributing industries :								
Transport and communications	3.04	*6.7*	6.62	2,180	1.25	*6.2*	0.37	300
Distributive trades ...	7.99	*17.6*	12.37	1,550	3.05	*15.0*	0.54	180
Finance, banking, insurance	1.44	*3.2*	4.64	3,220	0.35	*1.7*	0.12	340
Total	12.47	*27.4*	23.63	(1,900)	4.65	*22.9*	1.03	(220)
Service industries :								
Armed forces	0.40	*0.9*	0.48	1,200	0.36	*1.8*	0.08	220
Government service ...	3.27	*7.2*	5.70	1,740	1.18	*5.8*	0.35	300
Domestic service	2.33	*5.1*	1.70	730	1.37	*6.7*	0.16	120
Other services	3.77	*8.3*	6.16	1,630	1.68	*8.3*	0.30	180
TOTAL	9.77	*21.5*	14.04	(1,430)	4.59	*22.6*	0.89	(190)
Total	45.55	*100.0*	67.68	(1,490)	20.29	*100.0*	4.09	(202)
Unemployed—								
Work relief	3.04		1.87	(620)	2.21		...	...
Other	5.4		...	...			...	...
LABOUR FORCE ...	54.0		69.55	(1,290)	22.50		4.09	(182)
Rent of dwellings ...			2.7	...			0.21	...
Income from abroad ...			0.2	...			0.21	...
Total			72.45	(1,340)			4.51	(200)
Adjustment			(3.2)	...			(0.16)	...
NET NATIONAL INCOME			75.6	(1,400)			4.67	(208)

Note.—U.S. employment figures based on S. Kuznets, *National Product in Wartime*, p. 146, with more detail given here. Employees of the Post Office, Government arsenals and navy yards, local government owned utilities excluded from government service and included in the appropriate industry. Output figures based on *Survey of Current Business* estimates, adjusting the industrial classification to correspond to the classification of employment, separating the rent of dwellings, adding pay in kind to the armed forces and domestic service, the imputed rent of houses, corporation taxes and capital outlays charged to current account, and deducting federal debt interest, employers' contribution to social insurance and inventory revaluation adjustments. The U.K. employment figures based on London and Cambridge Economic Service, Oct. 1945, *A manpower budget for 1950*, Table I, with small modifications. For the method of evaluating the output of industrial groups see my *Redistribution of Incomes through Public Finance in 1937*, pp. 54–8. Some of the latter figures are subject to considerable error. As far as possible output figures were related to the relevant employment figures, and the industrial classification adopted for the two countries is also identical. The net national income includes an adjustment not allocatable to industries for certain business expenses which are on the current definition part of the national income.

12. The distribution of the labour force in the two countries is set out in table 2. It can be seen at once that unemployment in the U.S. amounted to 8.5 million or 15.7 per cent of the labour force[1], and in the U.K. to 2.2 million or 9.8 per cent. The exact difference between these two percentages was engaged in relief work in the U.S. but their output per head, measured by their wages, was relatively low. Through the higher rate of unemployment part of the higher U.S. productivity was whittled away. 1938 for the U.K. and 1939 for the U.S. could be regarded as fairly ' normal ' pre-war years in this respect.

13. Employment in the two countries is divided in Table II into three main industrial categories : commodity producing, commodity distributing, and service industries. The broad classification given in this brief note is not altogether satisfactory. For instance, transport includes passenger transport which ought to be included in services, and similarly finance includes services not connected with the distribution of goods. Also, government service includes certain services which ought to be allocated to the distribution of goods, while there is an element in local government employment engaged in the production of goods, such as highway maintenance. These qualifications will have to be borne in mind. In both countries slightly more than half of the employed population is engaged in so called ' production ', the proportion being somewhat higher in the U.K. Somewhat above a quarter in the U.S. and somewhat below a quarter in the U.K. are engaged in distribution (in the broad sense). If we ignore the relative difference in the armed forces (remembering the state of Europe in 1938), the percentage in service industries was the same in both countries, about a fifth of the employed population. The percentage in government service in the U.S. was higher, accounted for by some 1¼ million teachers in public schools[2], but the percentage in domestic service less, leaving the same percentage for other services (which includes certain professional services rendered to business). The value of output has also been estimated for each industrial group. For certain groups in the U.K. these estimates are, owing to the lack of statistics, necessarily inaccurate.

14. The following ratios of productivity per man will be assumed, writing 1 for the U.K. : agriculture 1¼; mining 2½; metals 3; textiles and apparel 1½; food, drink and tobacco 1½; other manufacturing and utilities 2½; building and construction 1½. These figures are broad estimates, the one for agriculture based on a rough comparison of prices received by farmers in relation to net output per head as given in Table II, the others are based on Dr. Rostas's calculations, reinforced by the estimates given in the Reid and Bossom Reports. The index of productivity for industries other than agriculture averages 2.2 by the first formula of §5, and 2.0 by the second.[3] In-

---

[1] Estimate by Prof. R. G. D. Allen, London and Cambridge Economic Service, Jan., 1946, p. 13.

[2] In the American sense.

[3] The figure becomes 2.3 using (in my view incorrectly) the method of weighting of Dr. Rostas. The latter agrees with his overall estimate.

cluding agriculture, the index of productivity averages 1.8 or 1.9, writing 1 for the U.K. in each case. Now the index of total output comes to 3.63 using U.K. weights and 3.54 using U.S. weights. Since the ratio of the labour force in productive industries was 2.11 to 1, the index of the volume of output per man comes to 1.72 or 1.68. This figure is lower than the index of productivity because net output per head (in value terms) is different in different industries, being relatively low, particularly in agriculture in which a high proportion of U.S. population is engaged. Even if we assume that the productivity ratio was 1 in each industry, the productivity index would come to 0.9 using U.K. weights or 0.8 using U.S. weights, because of the higher proportion of the U.S. population in agriculture. The price-relative implied in these figures is 3.8 dollars to the £, somewhat lower for agriculture and higher for other industries. This, of course, refers to output prices ex-farm or ex-works.

15. The ratio of employment in commodity distribution was 2.68 to 1. Relating this figure to the volume of output to be distributed as estimated above, productivity per head in distribution comes to 1.35 (U.K. weights) or 1.32 (U.S. weights). Hence there can be no truth in the contention that U.S. transport and distribution is less efficient than the British, not even in the sense that more distribution is required because of the concentration of U.S. industry into large scale units.[1] A higher proportion of the employed population is engaged in U.S. distribution but this is so because they have to distribute more goods per head. The proportion engaged in distribution in the U.S. related to the volume of goods produced is decisively lower. But, for obvious reasons, differences in productivity cannot be as great in distribution as in production. Hence the overall figure, taking the production and distribution of commodities together, is bound to be reduced. But even so the index of output per head comes to 1.6 by either system of weighting, There emerges, however, another striking fact. The implied price relative for distributive services works out at 6.4 to 6.6 dollars to the £, a considerably high figure than that for output prices in production. In other words, net output per head (in terms of value) in distribution is so much higher in the U.S. that, in spite of higher productivity, money costs of distribution seem to be excessive. This seems to be a good example of the difference between the monetary and real approach to economic problems. Output prices including both production and distribution come to 4.6—4.7 dollars to the £.

16. The treatment of services does present certain conceptual difficulties. The relative numbers in the armed forces were due to circumstances about which it is impossible to generalise. The relative numbers in government service, in the ratio of 2.8 to 1, agree with the ratio of the two populations. The ratio in domestic service was only 1.7 and in other services 2.2. Output per head in U.S. service industries works out at 5—6 per cent higher than in the U.K. because of the lower proportion in domestic service with a low net

---

[1] This fact seems to refute the argument of Prof. Jewkes (*cf.* Manchester School, January, 1946, p. 4.)

output per head. The index of productivity is, of course, by definition 1. The output prices implied in services come to 7.0 dollars to the £.

17. Summarising the estimates, the volume of labour-produced output (ignoring relief work) was U.S. 3.2—3.4 to U.K. 1. Employment was U.S. 2.24 to U.K. 1. Hence the volume of output per head came to U.S. 1.4—1.5 to U.K. 1. The index of productivity for the economy as a whole also comes to 1.50—1.45. This coincidence is due to the fact that a number of factors cancel in the estimates, for instance the high proportion in U.S. agriculture against the low proportion in domestic service, both with a low net output per head. The price relative implied comes to 5.0—5.2 dollars to the £. Taking into account relief work, the rent of dwellings, and income from foreign investments, deflated by the same price index, the volume of net national income was U.S. 3.1—3.2 to U.K. 1, and income per head U.S. 1.11—1.17 to U.K. 1. In other words U.K. income per head was 85—90 per cent that of the U.S. Considering that a somewhat higher proportion of the national income was consumed in the U.S., but on the other hand a higher proportion of U.K. output entered into international trade, the consistency of this figure with that quoted in §10 is very satisfactory. Price relatives when corrected for the different proportions of adjustment in the national income estimates given in table 2 come to 5.0—5.3 dollars to the £. Reconstructing the estimates for consumption per head in the two countries,[1] and converting the price-relative from market prices to factor cost, 4.85 ±0.3 dollars to the £ are implied for the field of consumption. Since the dollar-pound relative is considerably higher in government expenditure (about 6 dollars to the £) and since consumption at factor cost covers only three-quarters of the national expenditure, the estimates for prices are also consistent.

18. The factors influencing income per head in the two countries can now be summed up in the following way :

U.S. hourly productivity in industry (*mining, manufacturing, building*) *to U.K.* 1	2¾ to 3
Effect of differences in working hours	−35%
Effect of averaging with productivity in agriculture	−16 ±1%
Effect of low net output per head in agriculture	− 8 ±2%
Effect of averaging with productivity in distribution	−8%
Effect of averaging with productivity in services	−7 ±3%
Effect of unemployment	−7%
Effect of relief work, rent of dwellings and foreign income	−4 ±1%
Effect of age composition of the population on labour force	−2%
Effect of education on labour force	−10%
Effect of other factors on labour force	−2%
U.S. income per head to U.K. 1[2]	1.1 to 1.2

T. Barna.

---

[1] The official estimates do not simply take consumption per head, but total consumption in each category is divided by the appropriate population ; tobacco consumption by adult population only, for instance.

[2] Dividing hourly productivity successively by 1.35, 1.16, 1.08, etc.

THE POTTERY WORKING PARTY REPORT

Introduction

Since last October the President of the Board of Trade has established tripartite Working Parties, composed in equal thirds of representatives of employers and workers and independent members, in fifteen industries.[1] The terms of reference in all cases are :

'To examine and enquire into the various schemes and suggestions put forward for improvement of organisation, production and distribution methods and processes in the industry, and to report as to the steps which should be taken in the national interest to strengthen the industry and render it more stable and more capable of meeting competition in the home and foreign markets.'

The Pottery Working Party was the first to complete its Report, and the Cotton Report followed closely. The latter has attracted far more attention, not merely because of the somewhat sensational character of the Memorandum of Dissent and the rejoinder of the Trade Union members, but because the problems of the cotton industry have been long in the public eye, and already in the 'thirties the principle of statutory measures to bring about re-organisation was accepted. The Cotton Party, moreover, had a great many studies and proposals on which to base their enquiries and recommendations—independent investigations, the Reports of the 1930 Clynes Committee, the Textile Factory Workers' Association, and the Cotton Board Committee as well as the Report of the Platt Mission to the U.S.A.

In Pottery, however, we are breaking new ground. The industry, though important in size—it employed some 68,000 work-people in 1935—and particularly so because of its high concentration in the Stoke-on-Trent area, so that half the insured workers in the area are dependent upon it, has not been the subject of the detailed scrutiny and controversy of coal, cotton, or iron and steel. Nevertheless, it presents many acute problems, some of a nature common to many industries, others peculiar to itself. Quite apart from the long run development of the industry, the Working Party had to consider two additional features : the experience of the industry under war-time concentration and 'utility' control of production and prices, and the Reconstruction reports of the British Pottery Manufacturers' Federation and the National Society of Pottery Workers[2], the latter being of outstanding importance in that the National Society of Pottery Workers attempted in their recommendations to find a system of control which would be consistent with the maintenance of the initiative of private manufacturers and, at the same time, would reach many of the objectives which, in the Society's view, could best be obtained by nationalisation, which is their long term policy. We shall, in the course of this article, draw attention to some of the important points of difference between the Working Party Report and theTradeUnion proposals.

---

[1] The industries are : Cotton, Pottery, Hosiery, Boots and Shoes, and Furniture, established in October 1945 ; Carpets, China Clay, Heavy Clothing, Cutlery, Domestic Glassware, Jewellery, Jute, Lace and Linoleum, and the Woollen Industry in April 1946.

[2] The employers' report was for private circulation among members of the Federation ; the workers' report was published in January 1945.

THE TERMS OF REFERENCE.

The Report deals mainly with the Domestic Pottery Industry, the largest section of the China and Earthenware Trade, producing in 1935 rather more than half the output of the trade, the principal remaining sections being floor tiles and glazed tiles, electrical ware and sanitary earthenware. On the whole the recommendations for Domestic Pottery apply also to the other sections, and one or two additional points are treated in a special chapter of the Report. In what follows it should be remembered that ' the industry ' refers to only one section of what is commonly included under the pottery industry.

Stability.

The two primary objectives of the Working Party were to find ways and means of achieving greater stability and efficiency in the industry. The former is clearly not a matter for the industry alone. Fluctuations in home demand for the products of an industry cannot be offset entirely by measures taken by the industry itself. Much can be done, no doubt, about seasonal fluctuations of an artificial kind (e.g. the fluctuations induced by the annual Exhibition in motor cars and wireless sets), about excessive fluctuations of fashion which could be averted by collective arrangements for limitation of styles in a certain period and so on, and by planning output in relation to the trend of demand in complementary products and services (e.g. housing and furniture). But there will still remain a residual movement which is a function of the movement of effective demand as a whole, and which can only be corrected by measures taken for the economy as a whole. Much the same is true of the export demand, although in this case something might emerge from a careful study of different export markets with a view to concentrating on those which, historically, have proved to be most steady, while, more positively, the export plans of the industry may be tied with reciprocal commercial agreements, to the extent that such agreements are compatible with international obligations.

The Working Party do not appear to have been much concerned with this problem. Admittedly any estimates of future movements of demand and any proposals aiming at stability must have been highly speculative. The trend figures given for the Domestic Pottery industry are as follows :

	Sales in 1935	*Estimated Yearly Sales Post War*	
	(in £ million)		
		(*a*) on basis of pre-war prices	(*b*) on current prices
Export	2	3.5	6.1
Home	5.5	7.0	12.2
Total	7.5	10.5	18.3

The figure for exports is obtained simply by adding 75 per cent, which is the general Government figure for export expansion, to the 1935 export figure, and then allowing for a 75 per cent increase in prices. The home demand amounts to an increase of 27 per cent above the 1935 level, again allowing a 75 per cent increase in prices, the increase in demand being expected as a result of the 'redistribution of national income and the policy of Full Employment.' As a target, the export figure is on the low side, exports in 1936, 1937 and 1938 being higher in volume and value than in 1935. The estimated rise in the price level is, presumably, based upon current prices, as the Report nowhere gives a figure for expected reductions in cost due to increased productivity. Something more might also have been said about the figure for home demand.

Unfortunately the Working Party do not set down side by side with these estimates the movement of the existing labour force in the industry. We have thus no means of knowing how the 40 per cent increase in output is to be obtained, whether by recruitment of additional labour, or by increasing the productivity of labour. In April 1946 the numbers employed in the industry were 51.5 thousand against 67 thousand in June 1939: that is to say in April of this year the number employed was only 77 per cent of June 1939, as against 96 per cent for all manufacturing industries. It is, of course, true that pottery was highly concentrated during the war—in 1943 and 1944 its labour force was down to 54 per cent of June 1939—but the rate of recovery, as compared with some other industries, taken in conjunction with the slowing down in the growth of the working population as a whole, suggests that the pre-war labour force is unlikely to be exceeded unless special measures are taken (e.g. a relative advance in wage rates and substantially improved working conditions).

The extent to which the anticipated increase in demand for table ware etc. may be met outside the pottery industry, e.g. by plastic ware, is also not discussed by the Working Party. The competitiveness of plastics will of course be correspondingly reduced by technical progress in pottery which brings down costs: and if we suppose that the competition develops only slowly, the above figures suggest that, to reach the output target, a 40 or even 50 per cent increase in productivity is required from the pottery industry.

Efficiency.

Increases in efficiency are clearly a matter both for the industry and the Government. The system of Income Tax allowances for wear and tear and depreciation, for example, have, in the past, discouraged the scrapping of old buildings and plant, and the point is well made in an Appendix to the Report that improvements embodied in the 1945 Income Tax Act do not go far enough.[1] The war time concentration scheme and 'utility' production undoubtedly prevented waste of labour. At the same time the efficiency of the industry will depend upon the intelligence and ability of the individual firms to make the utmost use of technical developments, and upon the capacity of the industry to organise collective services, e.g. research, which are more economically undertaken by the industry as a whole than by individual firms. The greater part of the Report is devoted to methods of improving efficiency.

---

[1] The Working Party propose increases in the balancing allowances when buildings and machinery are scrapped, a larger initial allowance for new buildings and plant, and a larger annual allowance for depreciation. It should be borne in mind, however, that tax reliefs of this kind are indiscriminate in their operation and cannot of themselves be expected to bring about smoothly any very rapid modernisation, such as appears to be necssary in pottery.

THE WORKING PARTY REPORT

'The present state of the pottery industry is not wholly satisfactory, but it has retained sufficient strength to set itself on its feet without interference by the Government in the operation of free competition.' As it stands, this general statement does not mean very much: the Cotton Working Party, for example, appears to have been sharply divided about the meaning of 'free competition.' The Pottery Party hasten to add one immediate and most important qualification. There must be an adequate and statutory minimum wage throughout the industry and 'it is necessary that the wage structure should be simplified and codified. This is urgent. The case for free competition within the industry would fall to the ground if this work were not completed before that competition again makes itself felt.' In endorsing the Trade Unions' wage demands in principle, and in fully endorsing the Apprenticeship scheme of the National Council for the Pottery Industry, the Working Party may have strayed slightly outside their terms of reference, but they did so rightly. Increases in efficiency, the introduction of labour saving (and cost reducing) machinery, inevitably raise the wage question, and unless there is the fullest consultation with the workers at every stage, such schemes cannot be pressed forward smoothly. As a rule, however, the interpretation of free competition seems to be close to that of the Cotton Dissenters, for the Report complains elsewhere of the lack of liaison with the Government and the consequent 'grievous waste of time and thought' in preparing plans for reconstruction.' The Union and the manufacturers, separately and jointly, spent a vast amount of time elaborating proposals with insufficient guidance from the Government of the day on lines fundamentally contrary to its policy.' How far this is true of the manufacturers' proposals one cannot say, since they are not published: but it is certainly not true that the Trade Union proposals are fundamentally contrary to the policy of the *present* Government, and in their Report the Union definitely envisaged a Government 'that will begin to nationalise industry', and would be likely to take positive steps to increase efficiency in non-nationalised industries.

In accordance with this interpretation of free competition, the Working Party's proposals tend to be rather statements of desirable objectives than of plans for their achievement. There are altogether thirty recommendations, covering a very wide field, all of them admirable in their intentions and many of them opening up important avenues for further investigation. We shall consider only a few of the major problems: Factory lay-out and new buildings;

Technological developments ; the small potteries; the number of shapes, items and decorations; exports; research; and price agreements.

Factory lay-out and new buildings

' While there are a few notable exceptions to the prevailing picture of squalor and inefficiency . . . in general it would be true to say that the vast majority of all the factories, both in the Stoke area and in the ' out-potteries ' are badly constructed, inefficient, and a menace to the health of the workers employed in them.'[1] The Working Party implicitly accepts this judgment of the Trade Union, and says that the industry ' requires very extensive rebuilding, replanning and modernisation.' Aged buildings and bad lay-out are not only a danger to health, but cause an excessive waste of labour in the manhandling of ware, which is a double cost, since it increases the probability of breakages. No estimates are given of the total cost of the rebuilding which would be involved in raising the level of the whole industry to any defined standard, but the Working Party sent out a questionnaire in December, 1945, asking firms to state their plans for rebuilding. The position, in their view, ' is not unsatisfactory, especially bearing in mind how little time the owners have had, during and since the war, to make blue-prints for the future.' The fact that there are more schemes for 1946 than the Government are likely to find it possible to licence is not, however, of much significance : six years accumulated plans at the *pre-war* rate of new building would almost certainly exceed permitted building in 1946 without consideration of any new blue-prints. The Working Party also take the view that the modernisation of buildings and plant can be financed out of the industry's own resources, supplemented in some cases by loans from one of the reconstruction finance corporations. Thus, given the modifications of income tax which they propose, they believe that the industry will modernise itself.

It is difficult to be altogether convinced by this line of argument. The Trade Union quotes a leading English manufacture, who said in 1915 ' I firmly believe that in the whole of the Staffordshire district over 60 per cent of the potteries ought to be scrapped and modern works put up '. In the view of the Trade Union the present position is relatively worse than in 1915, i.e. the proportion of obsolete potteries is higher. Will the provision of cheaper money and improved tax allowances make all the difference ? In any case, if the radical modernisation is to take place it stands to reason that this mass of investment needs to be planned, to give continuity through time and to relate the capacity of the reconstructed industry to expected output. ' Free competition ' may function well in periods of slow and gradual change: it is not the instrument for this kind of problem.

Technological Developments

The two outstanding recent developments are automatic and semi-automatic plate making machinery, developed in the U.S.A., and the tunnel kiln,

---

[1] Report of the National Society of Pottery Workers, p. 4.

It is in order to allow for the introduction of the latter in particular that new lay outs are required.[1]

At present plates are largely produced by skilled operatives working with a jigger and assisted by another, unskilled operative. The Report gives figures for comparative outputs by the three methods of production which can be best illustrated by putting them all on the basis of an output of 800 dozen small plates per day.

Output of small plates a day.

	Equipment	Operatives	Output
1. Hand made	8 jiggers	16 (8 skilled)	800 dozen
2 Semi-automatic	4 semi-automatics	6	800 dozen
3. Automatic	1 automatic	3	800 dozen

The saving of labour at this stage of production is manifest, and even startling. But the reduction in *cost* is, according to the Report, very slight. The saving of semi-automatic machines over hand-made production is stated to be a mere penny a dozen plates. (This figure is not given as a ratio). For the larger plates the Working Party states that even this saving disappears. The fully automatic machine appears to be even less worth-while : ' Such a machine can probably interest only a large firm supplying the market for good and inexpensive, but somewhat standardised ware, especially certain export markets, the catering trade and the chain store trade. There will undoubtedly be a move by some firms in this direction, but unless there are further developments in fully automatic machines, semi-automatic machinery seems to offer sufficient saving in man-power and just as much saving in cost of production for considerably less capital and without impairing the commercial flexibility of the small and medium-sized business.' No details whatever are given in support of this sweeping generalisation.

We try to show in Appendix B that if it were simply a matter of prdducing large quantities of a few lines of small plates[2] regularly throughout the year, both the semi-automatic and the fully automatic machine offer considerable savings in the cost of making plates. Such a cut in the *conversion* cost will of course only mean a relatively smaller reduction in the *price* of the articles. This is the crux of the matter.

From the social point of view the reduction in the conversion cost is a good measure of the social gain ; to the individual firm the question is whether the reduction in *price* is so great that the firm can reasonably hope to break through a highly imperfect market and sell much larger quantities of articles. From the context it is clear that the Working Party looked at the automatic machine through the eyes of the individual firm, and in so doing they failed to see its full significance. The output of such a machine is given as 800 dozen small plates a day (presumably single shift), which, assuming a five-day week, 40 weeks of the year, gives an annual output nearly 2 million pieces. The total production of small plates and saucers in the first quarter of 1946 was at an annual rate of 95 million pieces.[1] If the number of shapes were kept within reasonable limits, 50 machines would do the lot.

---

[1] The Report contains two useful plans : of an existing pottery and a possible revised lay-out on the same site.

[2] No doubt similar results might be obtained for other products which the automatic machine can make.

Even with twice the present output the number of machines required altogether would still be small. It should of course be stressed that the versatility of the automatic machinery is limited. It is no use having an enormous output of flatware, cups and bowls if there are no teapots and jugs to form sets. The possibilities of cost reduction are thus dependent upon the size of potteries, the degree of standardisation and the distributive organisation.

The Report is far more definite about tunnel kilns. Here again no costings are provided but we are informed that 'The industry is convinced of their advantage over the old intermittent oven, and the demand for them is overwhelming.' Although the design of these kilns is still in its early stages, the Working Party urges that standardisation of kiln design should be pressed forward.

The Small Potteries.

How will automatic machinery and the tunnel kiln affect the small potteries ? Before the war nearly one half of the potteries employed less than 100 operatives.[2] A 100-operative factory probably has a capital employed of about £17,500 at pre-war prices.[3] It appears that with the present scale of *capital* small firms could not have both modern buildings and automatic machinery. The Working Party admit that at present the modern methods are beyond the scope of the small pottery but express the hope that further technical progress will bring the minimum economic output of tunnel kilns and automatic machinery within the scope of the small business.

For some small firms, of course, making highly specialised ware in limited quantities, the question of automatic machinery may not arise, but it would be a mistake to assume that all small potteries are highly specialised. On the contrary, many of them are making low and medium grade ware, differing only in a slight and, in a sense, random degree from the output of the next man. Moreover, the problem of the small pottery is not only one of automatic machinery and tunnel kilns. The Working Party lay down certain essential conditions for a sound pottery:

(1) Each pottery should employ at least one first class manager. At present managers may earn little more than the workers themselves: consequently first class men are not attracted.
(2) Each firm should have a qualified engineer on its staff.
(3) Every pottery should have a good designer on its staff, paid a good salary.
(4) Large factories should have their own research *departments*. 'Even the small pottery should consider carefully whether it can afford not to

---

[1] Cf. Statistical Digest, June 1946, Table 69.

[2] *Cf.* Appendix A.

[3] The turnover (gross output) per operative in the domestic pottery industry was about £175 p.a. in 1935. The capital turnover ratio for the industry as a whole is given as 1 : 1. Thus the capital employed in a 100 operative firm would be about £17,500.

employ at least one man with adequate scientific training to look after its research needs.'

The Working Party recognise that this ideal is far beyond the capacity of the small firm. Thus: 'Smaller potteries should group together to employ one engineer jointly': and again 'It may well be that small firms will not be in a position to employ a first class designer at a high salary full time, and it is recommended that some scheme of co-operation should be devised whereby it would be possible for a group of three or four small concerns, such as a small china firm, an earthenware house, a manufacturer of fancy decorated goods, and a producer of tiles, to employ a first class designer between them.'[1]

The Report further advises small firms to undertake co-operative buying of raw materials and co-operative selling, especially in export markets (see below).

Why not, after all this, a scheme for the amalgamation of small potteries? The Report gives only one argument for rejecting it: 'Each (owner of a small pottery) prefers to be his own boss; a position that carries both concrete and intangible advantages.'

The number of shapes, items and decorations

'The fewer the shapes and items made by a manufacturer, and to a lesser extent the fewer the patterns of decoration applied to them, the lower will be the cost of producing them.' The need for longer runs of production, and the fact that prior to the war the number of shapes, items and decorations was excessive, are recognised by the Working Party. In this diagnosis, they agree with the Trade Union. The latter argued that the solution to the problem, which is of course not restricted to pottery, could be found along two lines: the maintenance and development of the 'utility' production of war time, and bulk buying on the part of the Government. The latter 'would provide a guaranteed mass market: it would help to make practicable such technical advances as the use of tunnel ovens, which need to be kept working continuously over fairly long periods; while it would also provide a method of price control which would at once cut out much of the red tape and complications involved in other methods.'[2] The Working Party dismiss both these suggestions in a couple of tiny paragraphs: utility control is 'difficult to enforce (it requires, for example, the registration of shapes) and, in the course of time is deadening to enterprise.' As for Government bulk buying: 'We do not see in what way the Government can do better in this respect than the existing large buyers such as the chain stores, and there is likely to be serious additional wastage in the warehousing and breaking bulk that are the functions of the wholesaler.' Elsewhere the Working Party declare themselves satisfied with the methods of distribution 'and found no good reason to recommend any changes in the character of distribution.' Their case however would have been more convincing had they brought forward any facts to support it. Are we to suppose, for example, that the economies of war-time utility production were so slight that the question was not worth raising? If so, it would have been important to state the facts explicitly. That pots break in wholesale warehouses is surely a disingenuous argument against bulk-buying: presumably the chain stores take delivery direct to the individual store as far as possible and do not take all delivery through a central warehouse. Moreover, having rejected the principle for the industry as a whole the Working Party promptly concede it for the small potteries who are 'strongly urged to consider the advantages of co-operative buying and selling organisations.'

---

[1] The versatility of the designer is required by the rules of free competition which, it appears, preclude the designer from working for several firms in the same section.

[2] T.U. Report p. 14.

The Report attributes the multiplicity of shapes and designs before the war to the fact that potters were weak sellers, and to ignorance on the part of manufacturers of the true marginal cost of changes of design and decoration. 'The management of potteries will be well advised to have a clear policy in this matter themselves and to see that it is well understood by their salesman. In particular, they should be honest with themselves about the true cost of making special lines to suit a customer. Having decided upon the prices for their standard (or 'catalogue') lines they should make up their minds that the prices of any other lines should be substantially higher corresponding to the extra cost of such ware.'

Whatever the value of exhortations to manufacturers to turn over a new leaf, this type of solution, if it has any effect at all, is likely to work itself out slowly over the industry as a whole. It clearly has no bearing on the kind of difficulties which arise if a large scale investment, aiming at a 40 per cent or 50 per cent increase in productivity, is planned in a short period. The scale of output involved with automatic machinery and tunnel kilns is such that the risks are probably too great for any but the largest firms unless a fairly guaranteed market can be ensured in advance.

Exports

The Working Party anticipate that the Government will set permanently some sort of export 'ratio' for each individual manufacturer (under conditions of excess demand in both home and export markets, as at present, the ban on decoration combined with the price control for the home trade are adequate for this purpose: presumably a modified scheme would be needed when the pent-up demand in the export markets is exhausted). This means that many firms who, hitherto, have not been exporters must enter the new field. The Working Party considered whether large exporters might take these 'new boys' under their wing, but 'even assuming the willingness of the large exporters to give such direct help to their competitors, there is little they could do for them in helping to sell different products in different markets.' They do, however, recommend the formation of a co-operative merchanting company for the smaller potteries, though they do not think that such a company will stand much chance of attracting experienced staff away from the large individual exporters. The Trade

Union's idea of an overall merchanting company for the whole trade is not considered.

Research, Costings, Design, etc.

The Working Party make a number of valuable suggestions for costing, design and so on. They recommend the systemisation of costings and the evolution of a practical method of ascertaining the true cost of individual articles, including the actual loss incurred at each stage. The long section on research is particularly interesting. The Research Association appears to have had serious teething troubles, partly because of a confusion of thought among manufacturers as to its purpose, some of whom expected a technical consulting service rather than fundamental research. The Working Party attempt to straighten out the affair. But their claim that ' the industries of this country which have maintained their vigour in international competiton ' rely for their success on private research departments rather than co-operative research, and that accordingly the potters should forge ahead with their own departments rather than with co-operative research is not altogether convincing. The economies of scale in industrial research are considerable, and it may well be that the successes alluded to in the Report are more a function of the total expenditure on research than of its private, as distinct from co-operative, nature.

Voluntary Minimum Price Agreements

In the domestic ware, glazed tile, and the sanitary earthenware sections of the pottery industry voluntary minimum price agreements have existed continuously for some time. The Manufacturers' Federation asked for the statutory enforcement of such agreements. The Working Party reject the request and refer the question to the Government, which in any case must formulate a policy with regard to such agreements in all industries, and add that, in their view, all firms should be required to supply the Government with regular information about their costs of production and profits, and that the Government should interest itself actively in the steps that are taken by the industry to improve its efficiency. The idea of *maximum* price control by the State, which the Trade Union brought forward, bearing in mind the possibility of a continued high level of demand for a long period ahead, is not examined by the Working Party.

CONCLUSION

It is often forgotten in proclaiming the advantages of private enterprise and free competition that in order to reap these advantages, maximum efficiency and optimum distribution of resources, the individual entrepreneur must work within very strictly defined limits. A homogeneous product and a market price for both product and factors of production *outside his control*, these are his data. The freedom of the entrepreneur is limited to variations in the scale of output and to the proportions in which the factors of production are combined. But if, owing to market imperfections, monopolistic price agreements, etc., the ' hidden hand ' ceases to set the correct limits to entrepreneurial freedom and even ceases to function altogether, then, if the aims of efficiency and optimum distribution of resources are to be obtained a new set of limits must be imposed, and the only way in which this can be done is by Government action.[1]

The major proposals of the National Society of Pottery Workers were a step in this direction. In the Trade Union's view the main needs of the industry are for the scrapping of obsolete plant and factories, a radical programme of new building, with modern lay-out, new machines and kilns, long runs of production, the systemisation of wages and the establishment of a minimum wage, and the expansion of research. They accordingly proposed, first of all, a system of licensing. Only those firms should be allowed to produce which, after a certain date :

(1) Conform with the Lead and Dust Regulations, the Factory Acts, and any other standards that may be laid down by the Government.

(2) Accept the obligation to observe the agreements in regard to rates of wages and conditions of work made between the Manufacturers Federation and the National Society of Pottery Workers, or any other Union concerned with the workers employed by pottery manufacturers.

(3) Conform with an agreed scheme of apprenticeship for the industry.

(4) Provide whatever figures and statistics may be required relating to the general conduct of the industry.

Secondly, they proposed a combination of a modified scheme of ' utility ' production, accompanied by bulk-buying by the Government which would aim at reducing the excessive number of shapes, items and designs and would allow for the control of maximum prices. In accordance with the principle of replacing the ' hidden hand ' by a new set of rules imposed *from outside* the Union proposed that the Board, representing employees and workers, should be advisory only, and that all statutory powers, of licensing, price control, etc., should be exercised by the Government.

This framework of control would have proved a most fruitful starting point for the Working Party's discussions, which should have been directed towards evolving a definite plan of rebuilding and re-grouping the firms within the industry, and the establishment of the administrative machinery to carry it into effect. For whatever reason, the Trade Union members appear not to have been able to set the Working Party going along these lines and in the event the discussions did not even reach the point from which they should have started. Both sides of the Trade Union's framework of control were rejected and the immediate problem of rebuilding was hardly considered at all. Of the first part of the Union's scheme the Working Party say: 'All of ther equirements to be enforced by licences can as well be enforced by action *ad hoc* by the Ministry of Labour and the Board of Trade, as the case may be . . . ' And the Working Party are in favour of tightening up the Factory Acts, the enforcement of minimum wages, and the acceptance of the Apprenticeship scheme. Thus they differ from the Union not in principle, but in the method of enforcement, although the difference may be substantial in practice. Action *ad hoc* enforced by different departments of State for different objectives must inevitably be taken *after* the damage is done. Licensing would ensure that when new firms set up, or are rebuilt, the chance of infringement of regulations would be made less: moreover, it is a much more powerful sanction than any fines and penalties enforced under particular Acts. The very existence of such a sanction would probably act as a sufficient spur to obviate its use on all but the rarest occasions.

---

[1] For a full treatment of the theoretical aspects of the problem *cf.* Lerner : *Economics of Control.*

For the other side of the Union's scheme of Government control, the system of quality and price control through ' utility ' methods and Government bulk-buying, the Working Party offer the alternative of self-restraint and certain proposals for voluntary organisation on the part of pottery manufacturers. In the light of past experience and in view of the scales of output involved with the use of automatic machinery this alternative seems quite inadequate. Obviously, in the very short time given to the Working Party, it was not possible to thrash out all the problems in detail, and it might be claimed that the proposal to set up a permanent Board, of members *selected* from both sides of the industry and independent experts, with a full time Chairman and a permanent civil-servant as Secretary, will enable the work to be continued. This might be conceded if the lines of advance had been clearly defined by the Working Party. But there is no general scheme for the industry, no plan sufficiently concrete to hold out any hope that the massive reconstruction which is needed in pottery is likely to take place in the near future.

G. D. N. Worswick.

APPENDIX A

Size of Firms in the Domestic Pottery Industry

The Working Party Report deals mainly with the domestic pottery section of the industry. There are, however, no separate figures for the size of firms in this section. The 1935 Census of Production give the following information for the China and Earthenware Trade as a whole :—

Size of establishments in 1935.

Size of establishment (Average no. employed)	No. of establishments
11—99	196
100—199	91
200—749	101
750 and over	11
Total	399

In addition to the 399 establishments (covered by 374 firms), 208 firms employing not more than 10 persons on the average made returns. The National Council of the Pottery Industry gives figures for the size distribution of all potteries in the Stoke district for ' pre-war ' :

Size of factories pre-war (Average no. employed)	No. of factories
Less than 100	150
100—200	71
200—600	86
600—800	10
Over 800	10
Total	327

The National Society of Pottery Workers' Report states that 85 per cent of the pre-war output of pottery was produced in the Stoke-on-Trent area. If we assume that the National Council's figures also exclude the tiny firms employing not more than 10 operatives, it will be seen that the size distribution in the Stoke area is very similar to that in the country as a whole.

Size distributions for the separate sections are not given but we can obtain from the 1935 Census of production a comparison of the average size of establishment in the various sections :

Size of establishments in the China and Earthenware Trade in 1935

Group	No. of establishments	No. of persons employed	Avg. no. employed per establishment.	
1. Floor tiles and glazed wall and hearth tiles	58	9,825	169	
2. Electrical Ware	14	5,188	371	
3. Sanitary earthenware	30	3,830	128	
4. China and Porcelain other than electrical ware	48	7,695	160	194
5. Earthenware, other than sanitary ware and electrical ware	199	40,347	203	
6. All other output	50	1,652	33	
Total	399	68,537	171	

How much of the group 'China and Porcelain, other than electrical ware' should be included in the Working Party's definition of Domestic Pottery—'Tableware and Fancyware of earthenware and china, Jet and Rockingham'—is uncertain. On the one hand, reference is made to 'some 200 factories in the industry,' which suggests that only the item 5 (Earthenware other than sanitary ware and electrical ware) in the table above is to be considered. On the other hand, we are told by the Working Party that the industry supplied £5.5 million to the home market and exported £2.0 million of ware in 1935. Total production (value at factory) of the earthenware group above however was only £6.08 million, and £1.70 (f.o.b.) was exported. The production of bone china (which comes in the Census under 'China and porcelain, other than porcelain and electrical ware,' and constitutes 94 per cent of the production) was £1.45 million of which £0.3 million were exported. These items, earthenware, and china and porcelain, taken together—square with the figures given for home production and export by the Working Party: but in that case we are dealing with nearer 250 establishments.[1] In any case the average size of establishment in the domestic pottery section is somewhat higher than that of the China and Earthenware Trade as a whole. Nevertheless the difference is not great. For the trade as a whole (ignoring the firms employing not more than 10 operatives) we have one half of the establishments employing less than 100 workers, and nearly three quarters employing less than 200. Slightly smaller figures would be reasonable for the domestic pottery industry.

---

[1] Throughout the Report the use of statistics is casual, where it is not misleading. For example, in the electrical ware group the Census of Production gives 14 establishments employing 5,188 workers in 1935, while the Working Party states : 'This section of the industry comprises about twenty firms, and employed some 5,200 workers in 1935 according to the Census of Production.'

APPENDIX B

Cost Reductions from Automatic Machinery

The Working Party give data which enable us to compare the labour requirements of the three methods of plate making (hand-made, semi-automatic and fully automatic machinery) on the basis of a daily output of 800 dozen small plates (see p. 00 above). For this output of 800 dozen plates a day we shall first estimate the savings in labour cost *per annum* at pre-war rates of wages.

Wages for the skilled operatives were £2 15s.—£3 5s. a week, and for the unskilled attendant operative (usually a juvenile) 11s. to 25s. a week. The workers required for semi-automatic machinery are described by the Working Party as relatively unskilled, so that we shall impute to such workers a rate of £2 10s. a week. For the operatives on the fully-automatic machine we shall take the same rate as a skilled operative working with a jigger, i.e. £2 15s. to £3 5s. a week.

With 4 semi-automatic machines, 6 semi-skilled workers replace 8 skilled and 8 unskilled operatives using the jigger. The annual saving in labour cost is thus between £600 and £1,100 a year. With one fully automatic machine, 3 skilled operatives replace 8 skilled and 8 unskilled operatives, representing an annual saving in labour cost of £950 to £1,350 a year.[1]

The average rise in wage rates in all industries since September 1939 is at present 60 per cent. It is implied that a *relative* upward movement of pottery workers' wage-rates is necessary, if manpower is to be retained. We shall, however, ignore this point in our calculation and take only an increase of 60 per cent.

The saving in labour cost involved now becomes:

With 4 semi-automatic machines	£960 to £1,760 a year
With 1 fully automatic machine	£1,520 to £2,160 a year

at hypothetical post-war rates of wages.

Whether this saving is worth seeking depends upon: (*a*) the cost of automatic machinery; (*b*) the rate of interest on borrowed capital; (*c*) the rate at which the machine is written off; (*d*) the difference in direct conversion cost other than wages, e.g. fuel and repairs, between hand-made and automatic production.

---

[1] We have taken a 52 week year, since holidays with pay were instituted before the war.

Let £x and £y respectively be the cost at which it would be worth while to instal a semi-automatic and a fully automatic machine. We shall take 5 per cent as the rate of interest[1] and allow for writing off the machines on the straight line principle in 10 years.[2] We have no data on running costs and shall assume no saving over hand-made production. With these assumptions the annual overhead cost per machine is easily seen to be 12.75 per cent. of the initial cost of the machine (approximately).

Thus, assuming full use of the machines throughout the year, semi-automatics would be worth installing if their current price were less than

$$x=100 \frac{100}{4 \times 12.75} (\pounds 960 \text{ to } \pounds 1{,}760) = \pounds 1{,}900 \text{ to } \pounds 3{,}450,$$

and fully automatics if their price were less than

$$y=100 \frac{100}{12.75} (\pounds 1{,}520 \text{ to } \pounds 2{,}160) = \pounds 12{,}000 \text{ to } \pounds 17{,}000.$$

The current costs of semi-automatic and automatic machines are, we are informed, respectively £1,440 (on quay at Liverpool) and £7,000 (free on ship New York). On the basis of the above calculations, it would appear that, assuming for the moment steady running of the machinery, there is an ample margin to justify the installation of the machine. This conclusion is very much strengthened if we allow for : (*a*) a *relative* rise in wage rates which the Working Party implicity require in order to retain manpower in the industry ; (*b*) somewhat less conservative finance with regard to depreciation ; (*c*) a lower rate of interest ; and (*d*) shift working, which would cut down capital costs per unit of output.

We cannot, in fact, assume continuous running throughout the year. Time will be lost in changing types, repairs and so on. Nevertheless, if the allowance is made for discontinuity in production, a comparison of actual costs with the mean estimates for x and y suggests that a cut in conversion cost of the order of 30 to 50 per cent is not out of the question.

---

[1] The average rate of profit on turnover in the years 1923–38 for the industry as a whole was 4 per cent. The turnover capital ratio was 1 : 1, and profit here includes rent, interest and tax. It might accordingly be argued that we cannot take a figure for interest greater than 4 per cent without infringing the earlier assumptions made by the Working Party about the finance of reconstruction.

[2] This again appears to be a conservative figure. In making cost estimates for automatic looms the Costs Sub-Committee of the Cotton Working Party wrote off in 20 years on single shift and 15 years on double-shift.

TABULAR APPENDIX.

EDITORIAL NOTE

Tables relating to British economic developments, are given below. As far as possible 1938 is taken as the base year for index numbers. Absolute figures for any year are generally given as monthly or quarterly averages to ensure comparability. Detailed information about the different series can be found in the sources quoted.

Explanation of symbols used.

(. .) — figure is provisional or approximate.

N.A. — figure is not available.

— — figure is negligible.

A. ECONOMIC DEVELOPMENTS IN GREAT BRITAIN.

TABLE I

Employment by Industries in Great Britain

	Total						
Million persons employed	Mid 1939	Mid 1943	Mid 1945	1945 Oct.	1945 Dec.	1946 Mar.	1946 April
1. Metal and Chem. Ind.	N.A.	N.A.	4.35	3.78	3.64	3.51	3.51
(*a*) for Civilian Use	2.04	0.92	1.21	1.85	2.33	2.77	2.88
(*b*) for Supply of Forces	N.A.	N.A.	3.14	1.93	1.31	0.74	0.63
2. Other Manufactures	N.A.	N.A.	2.58	2.69	2.75	2.70	2.75
(*a*) for Civilian Use	3.63	1.75	1.82	2.11	2.25	2.37	2.44
(*b*) for Supply of Forces	N.A.	N.A.	0.76	0.58	0.50	0.33	0.31
Total Manufactures	*6.90*[1]	*7.85*[2]	*6.93*	*6.47*	*6.37*	*6.52*	*6.57*
% for Civilian Use	81	34	44	61	72	83	85
% for Exports	(14.5)	3.2	6.9	12.0	14.2	18.6	19.2
3. Basic Ind. and Services	4.68	5.03	5.11	5.11	5.11	5.20	5.24
(*a*) Agriculture, etc.	1.11	1.12	1.11	N.A.	1.01	1.01	1.01
(*b*) Mining and Quarrying	.87	.82	.80	.78	.79	0.79	0.79
(*c*) Transport, Shipping, Fishing	1.27	1.19	1.26	1.29	1.31	1.37	1.39
(*d*) Govt. Service (Nat.+Local)	1.39	1.79	1.82	1.80	1.79	1.79	1.81
4. Building and Civ. Eng.	1.31	0.73	0.72	0.81	0.90	1.04	1.08
5. Distributive Trades	2.89	2.01	1.96	2.01	2.05	2.11	2.13
6. Other Services	2.11	1.51[4]	1.49	1.51	1.54	1.58	1.60
Total Employed[3]	17.91	17.12	16.21	15.90	15.91	16.45	16.62

Source: *Ministry of Labour.*

[1] Including 1,27 million engaged in producing equipment and supplies for Forces.

[2] Including 5,18 million engaged in producing equipment and supplies for Forces.

[3] Excluding Forces and Auxiliary Services, Civil Defence and Police, and private domestic service.

[4] Excluding non-manual workers earning over £420.

TABLE II

Regional Distribution of Insured Persons and of Numbers of Registered Unemployed (000's).

	Insured Persons[1]			Registered Unemployed[2]					
July	1939	1943	1945	1939	1943	1945	Jan. '46	Mar. '46	May '46
London and S.E.	3,655	3,024	2,861	170	13.9	11.6	24.5	30.8	34.8
Eastern	737	729	676	37	2.3	2.1	8.6	10.4	7.5
Southern	629	669	619	43	1.8	1.7	7.7	8.2	8.1
S. Western	737	756	698	34	2.0	2.8	.90	10.1	10.4
Midlands	1,501	1,534	1,378	82	2.4	8.1	24.0	21.9	18.5
North Midlands	1,098	1,051	979	71	1.7	2.0	9.3	10.5	7.3
North and Eastern	1,437	1,333	1,237	121	4.9	6.6	17.1	19.4	19.7
North Western	2,396	2,250	2,072	286	10.2	13.1	50.5	63.4	70.5
Northern	850	832	817	116	7.7	11.7	45.2	50.3	50.9
Scotland	1,650	1,555	1,463	190	16.7	22.0	63.7	74.1	75.2
Wales	687	721	678	106	9.7	21.3	68.2	69.6	66.9
Northern Ireland	348	370	358	70	17.2	17.0	30.8	32.5	30.9
Total	15,157	14,292	13,300	1,326	91	120.4	360.2	404.4	405.8

Source : *Ministry of Labour Gazette.*

[1] Estimated number of insured persons aged 14 and over under the General Scheme and the Agricultural Scheme in July in each Region as contributed in July 1945.

[2] Number of wholly unemployed persons registered at Employment Exchanges; including casuals and temporarily stopped.

TABLE III

Symptoms of Investment Activity in U.K.

Monthly Average Rates	*1938*	*1945*	*1946*	*1946*	
			1st qtr.	*April*	*May*
Output of Cement[1] ('000 tons)	643	338	409	501[7]	685[8]
Index 1938=100	100	52.6	63.6	77.8[7]	106.6[7]
Output of Bricks[2] (million)	610	102	154	200	248
Index 1938=100	100	16.7	25.3	32.8	40.6
Home Deliveries of Steel ('000 tons)	818	962	885	921	928
Index 1938=100	100	117.6	107.2	112.6	113.6
Merchant Shipbuilding[3]	780[6]	1476	1586	1662	1659
Index 1938=100	100	189.2	203.3	213.2	211.6
Commercial Vehicles[4] Produced (No.)	(4201)	4683	8990	12,260	11,892
Index 1935=100	100	111.5	214.0	291.8	282.8
Deliveries of home-produced Machine Tools[5] (£'000)	N.A.	3046	2765	2597	N.A.

Sources : *Board of Trade Journal, Accounts Relating to Trade of U.K.* and *Monthly Digest of Statistics*

[1] Figures relate to nearly all the firms in the industry.

[2] Great Britain.

[3] Thousand gross tons under construction at end of period (all ships of 100 gross tons and over, including merchant type vessels built for the Navy).

[4] Including omnibuses, but excluding service vehicles. For the base year 1935 the number of service vehicles cannot be separated.

[5] Revised series, comprising Metal- and Wood-working Machine Tools, Electric Motors, and Welding Sets, but excluding Metal-working Small Tools, for which figures have been discontinued.

[6] These figures have been taken from Lloyd's Register and are not strictly comparable with the figures in the rest of the table. The Lloyd's figures refer to U.K. + Eire, and include certain non-propelled lighters.

[7] 4-week period. [8] 5-week period.

TABLE IV

Coal Production and Employment

	1938	1944	1945	1945				1946
	Quarterly Averages			1st qr.	2nd qr.	3rd qr.	4th qr.	1st qr.
Mined Coal—								
Saleable coal produced (000 tons) ...	56,748	46,025	43,471	45,497	43,687	39,672	45,029	45,219
Av. number of effective[1] wage earners (000's)...	N.A.	641.6	628.9	647.7	648.8	592.6	626.6	625.6
Opencast Coal[2]*—*								
Saleable coal produced (000 tons) ...	—	2,162	2,029	1,887	2,208	2,051	1,971	1,709
Av. Output per man-shift worked (tons)	1.14	1.00	1.00	0.99	0.99	0.97	1.02	1.02
Av. ditto at the face[3] ...	3.00	2.76	2.70	2.68	2.68	2.65	2.77	2.76

Sources: Ministry of Fuel and Power *Statistical Digest* and *Board of Trade Journal.*

[1] Effective numbers exclude those absent for the whole of any week.

[2] Government opencast operations were commenced in 1942.

[3] Additional categories included as workers at the coal face from 1943, causing apparent reduction in average output by about 4%.

TABLE V

Retail Sales and New Supplies of Certain Consumer Goods (1943=100).

	1938	1944	1945	1945 Jan. Feb.	1945 March April	1946 Jan. Feb.	1946 March April
				Index Numbers of Retail Sales			
Total Sales	96	107	114	103	113	111	128
Food & Perishables...	90	105	110	103	110	109	119
Non-Food Merchandise ...	105	109	122	102	118	116	146
		Index Numbers of New Supplies for the Home Civilian Market.[1]					
Footwear[1]	(140)	95	96	93	95	102	N.A.
Other Clothing[1] ...	(190)	90	93	93	88	(111)	N.A.
Furniture & Furnish'g[2]	(420)	124	201	157	176	(316)	N.A.
Hardware[2]	(280)	94	117	103	103	N.A.	N.A.
Beer[3]	82	105	109	100	95	108	91
Spirits[4]	107	91	91	91	90	96	94
Tobacco[5]	86	99	105	104	96	112	105

Sources: *Board of Trade Journal* and *Monthly Digest of Statistics.*

[1] Based on coupon values.

[2] According to value at pre-war prices.

[3] Based on bulk barrels on which beer duty paid.

[4] Based on proof gallons on which duty paid.

[5] Based on net clearances mainly by manufacturers for home consumption.

Table VI

1. Retail Prices

	General Market Price Index		Ministry of Labour Cost of Living Index[1]				
	1944	1945	1944	1945			1946
	yearly averages (av. 1938=100)		yearly	averages	July	Nov.	June
				(av. 1938=100)			
Food	136	137	120	120½	125	120	120
Rent	102½	103	102½	103½	104	104	104
Clothing	179½	185	165	166	166	165	165
Fuel and light	133½	138	142	150½	152	152	152
Miscellaneous	176	177	166	166½	166	167	168
All Items	151	153	129	130	133	130	130

Sources: Cmd. 6784 (weights in current years) and *Ministry of Labour Gazette.*

[1] Prices on 1st of month.

2. *Board of Trade Index of Wholesale Prices.*

(1938=100)	1938	1939	1940	1943	1944	1945	1946 May
Basic Materials	100	107	159	187	198	201	200
Intermediate Products ...	100	102	139	164	168	173	183
Manufactured Articles ...	100	99	119	138	141	143	152
All Articles	100	101	138	161	164	167	171
Building Materials	100	101	117	144	147	150	162

Source: *Board of Trade Journal.*

3. *Import and Export Prices*[1]

	Imports					*Exports*			
1938=100	Dec. 1939	Dec. 1945	Jan. 1946	Mar. 1946		Dec. 1939	Dec. 1945	Jan. 1946	April 1946
Food, etc. ..	123	195	199	201	Textiles ..	110	230	235	239
Raw materials ..	137	218	219	229	Metal goods ..	102	171	176	181
Manufactures ..	142	177	175	175	Total Manuftrs.	106	186	190	194
Total	130	198	200	204	Total	106	186	189	192

Source: *Board of Trade Journal.*

[1] The indices measure the change in the aggregate value of a representative selection of imports or exports. For methods of calculation see *Board of Trade Journal*, April 13th, 1946.

Table VII

Ministry of Labour Index of Wage Rates[1].

	1944	1945		1945			1946	
	yearly averages		Oct.	Nov.	Dec.	Jan.	Mar.	June
Index (av. 1938=100) ..	142½	149	151½	152	153	155	158	159

[1] Monthly indices based on average rates at end of two successive months.

TABLE VIII 1. *United Kingdom Imports of Certain Commodities.*
(Thousand tons per month).

Commodity	*1938*	*1945*	*1946*	*1946*	
			1st qtr.	*April*	*May*
Wheat and flour	455	341	324	447	409
Maize and feeding stuffs... ...	411	59	18	20	1
Meat of all kinds	129	97	114	76	132
Butter	39	16	21	19	27
Fresh fruit and vegetables ...	176	38	69	43	40
Tobacco	13	14	15	16	16
Iron Ore[1]	425	340	480	500	578
Cotton[2]	43	32	24	33	49
Wool[2]	23	16	17	9	25

Source : *Accounts Relating to Trade of U.K.* and *Monthly Digest of Statistics.*

[1] Other than manganiferous ore. [2] Retained Imports.

2. *Exports of Produce and Manufactures of U.K.*

	Index numbers of volume			
Class of article	1938	1945	1945 4th qr.	1946 1st qr.
Food, drink and tobacco	100	89	90	88
Coal	100	8	13	14
Machinery...	100	49	60	83
Cotton yarn and manufactures	100	34	34	43
Woollen andworsted yarns and manufactures... ...	100	39	43	76
Silk and articificial silk yarns and manufactures ...	100	114	100	145
Chemicals	100	104	117	165
Vehicles	100	23	37	86
Articles mainly or wholly manufactured	100	45	55	91
All exports	100	45	55	84

Source : *Board of Trade Journal.*

3. *Retained Imports, Exports of U.K. Produce and Balance of Merchandise Trade.*

Monthly Average. Value : £ million. Index : 1938=100.	1938	1944	1945		1946		
				1st qtr.	*April*	*May*	June
Ret. Imports Value... ...	71.5	107.6	87.6	88.8	94.1	112.3	98.7
Vol. Ind.	100.0	80.2	63.0	63.0	N.A.	N.A.	N.A.
Exp. of U.K. Produce ...	39.2	22.1	32.8	61.4	69.4	85.2	65.0
Vol. Ind.	100.0	31.4	31.0	81.0	N.A.	N.A.	N.A.
Balance of Merch. Tr. (Value)	32.3	85.1	54.8	27.4	24.7	27.1	33.7

Source : *Accounts Relating to Trade of the U.K.*

ERRATA

United Kingdom Export Target, p. 175. Item 7 in Table II, ' Other Income ' in 1938 should read £35 million (not £25 million).

The dagger footnotes at the bottom of the same table refer to items 1 and 4 of the table.

Post-War Economic Prospects in U.S.S.R., pp. 196-7.

The evidence of output figures indicates that the rates of increase for tractors, motors and railway locomotives given at the bottom of page 196 should refer to increases *over the quinquennium,* instead of over the pre-war level (although the statement in the report of the Chairman of Gosplan to the Supreme Soviet in March implied the contrary). With regard to the increases for non-ferrous metals at the top of page 197 : there is here an apparent conflict of evidence between the wording of the draft plan itself and of the Gosplan Chairman's report on it ; the former speaking of rates of increase ' during the five year period ' and the latter of increases ' compared with the pre-war level '. In this case no absolute figures of output are available.

In the Table on page 197 the figures for sugar and paper are in *thousand* tons (not millions).

M.H.D.